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NAVAL WAR COLLEGE
Newport, R.I.


FORWARD...AMPHIBIOUS MANEUVER FROM THE SEA

BY


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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of [Joint Military Operations].

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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05 February 1999


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DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

DTIC QUALITY INSPECTED 4

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority: N/A			
3. Declassification/Downgrading Schedule: N/A			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): (U) FORWARD...AMPHIBIOUS MANEUVER FROM THE SEA			
9. Personal Authors: Lieutenant Commander J. Curtis Shaub, United States Navy			
10. Type of Report: FINAL		11. Date of Report: 05 February 1999	
12. Page Count: 25			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: EXPEDITIONARY FORCE, AMPHIBIOUS MANEUVER, COMMAND AND CONTROL, FIRES, MOBILITY, LOGISTICS			
15. Abstract: The Navy operational concept, "Forward...From The Sea," and the United States Marine Corps (USMC) concept, "Operational Maneuver From The Sea (OMFTS)," are intended to provide the Navy Expeditionary Force (NEF) with Innovative operational capabilities for exploiting emerging Technologies of the future. Ship-To-Objective Maneuver (STOM) is the key element of OMFTS, which will take advantage of the rapid maneuver of a combined force by air and surface means directly against inland objectives. OMFTS is the white paper that states what the Naval forces of the near future should be able to do. "Forward...From The Sea," however, does not answer the question from the Navy perspective, "How do we get there from here?" "Forward...Amphibious Maneuver from the Sea (FAMS)," when written, could be the combined concept, written by the Navy, which would begin to close the gap. It will provide the "ways and means" to support the "ends" that the USMC has proposed. The author will analyze potential challenges with doctrine, and with both current and advanced technologies as they appear in four key areas: command and control; fires; mobility; and logistics. It is these challenges which need to be addressed before these advanced concepts can come into fruition.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

19990520 058

ABSTRACT OF

Forward..Amphibious Maneuver From The Sea

The Navy operational concept, "Forward...From The Sea," and the United States Marine Corps (USMC) concept, "Operational Maneuver From The Sea (OMFTS)," are intended to provide the Navy Expeditionary Force (NEF) with innovative operational capabilities for exploiting emerging technologies of the future.

Ship-To-Objective Maneuver (STOM) is the key element of OMFTS, which will take advantage of the rapid maneuver of a combined force by air and surface means directly against inland objectives.

"Operational Maneuver From The Sea," is the white paper that states what the Naval forces of the near future should be able to do.

"Forward...From The Sea," however, does not answer the question from the Navy perspective, "How do we get there from here?"

The author proposes "Forward..Amphibious Maneuver From The Sea (FAMS)," which will be *the* combined concept, written *by* the Navy, which will begin to close the gap. It will provide the "ways and means" to support the "ends" that are proposed in OMFTS and STOM.

The author will analyze potential challenges with doctrine, and with both current and advanced technologies as they appear in four key areas: command and control; fires; mobility; and logistics. It is these challenges which need to be addressed before these advanced concepts can come into fruition.

INTRODUCTION

The Navy operational concept, "Forward...From The Sea," and the United States Marine Corps (USMC) concept, "Operational Maneuver From The Sea (OMFTS)," are intended to provide the Navy Expeditionary Force (NEF) with innovative operational capabilities for exploiting emerging technologies of the future.

Ship-To-Objective Maneuver (STOM) is the key element of OMFTS, which will take advantage of the rapid maneuver of a combined force by air and surface means directly against inland objectives.

As these emerging concepts and advanced technologies evolve, amphibious doctrine will too have to evolve. The tradition of relying on attrition warfare and amphibious lodgment no longer supports the flexibility of maneuver warfare. This historical reliance on ship-to-shore movement with operational pauses and reorganizations imposes inefficiencies and delays upon the momentum of the operation.

"Operational Maneuver From The Sea," is the white paper that states what the Naval forces of the near future should be able to do. It also states that this new concept provides the framework by which contractors, civilian employees, Marines and Sailors need work towards to attain this end. "Forward...From The Sea" states that "we will be a full partner in developing new amphibious warfare concepts and capabilities for implementing the Marine Corps concept Operational Maneuver From The Sea (OMFTS)."¹ "Forward...From The Sea," however, does not address the "ways and means" from the Navy perspective.

"Forward...Amphibious Maneuver from the Sea (FAMS)," when written, could be the combined concept, written by the Navy, which would begin

to close the gap. It will provide the "ways and means" to support the "ends" that the USMC has proposed. It will help answer the question, "How do we get there from here?" Though FAMS may not have all the answers, it will create the catalyst and framework by which Navy and USMC planners will be forced to address the process.

This paper will support the requirement for FAMS to be written by the Navy. The author will provide a brief background on the concepts supported in both "Forward...From The Sea" and "Operational Maneuver From The Sea," as our leaders look to the future. The author will then analyze potential challenges with doctrine, and with both current and advanced technologies as they appear in four key areas: command and control; fires; mobility; and logistics. It is these challenges which need to be addressed before these advanced concepts can come into fruition.

BACKGROUND

Naval forces of the United States are faced with a number of differing threats throughout the world as they strive to protect American interests. Once traditionally "blue" water in nature and depth, these threats are now becoming "greener," drawing our forces into the shallows of the littorals. These littoral regions, including both sea and land areas along the world's coasts, encompass seventy-five percent of the world's population, national capitals and major commercial centers.

In these littoral regions, "Operational Maneuver From The Sea is the response to both *danger* and *opportunity*."² *Dangers* exist in the form of weak governments struggling for power among their neighbors, military coups, terrorism, weapons of mass destruction, chemical and

biological weapons, religious intolerance, ethnic hatred, high seas piracy and natural disasters. Crisis response to these dangers in littoral regions has ranged from non-combatant evacuations, humanitarian relief, escort operations, maritime interdiction operations, famine relief, and peacekeeping to armed conflict.

Opportunities arise as these forward-deployed naval forces provide the joint force commander (JFC) with a wide range of capabilities and forces to bear during these crises. One such opportunity would be the ability of a JFC to project forces far inland against crucial supply lines. The destruction of fuel and ammunition destined for enemy tanks and infantry on the front lines would have a profound effect on the enemy's capability.

Other opportunities emerge from the ability of the JFC to quickly respond to natural disasters. Forward-deployed amphibious readiness groups (ARG), can be directed to disaster sites in a matter of days. Troops can be flown in by helicopter to provide medical support, bridge construction, and humanitarian aid.

The use of the sea as a medium for operational movement, sea-based logistics and sea-based fires create the opportunity for applying leverage against critical vulnerabilities essential to the enemy's ability to effectively continue the resistance.

A forcible entry capability will continue to be "the mission" of the USMC as they operate from Navy amphibious ships. These ships of the Amphibious Task Force (ATF) will transport, project ashore, support, recover and redeploy the Marine Air-Ground Task Force (MAGTF). Operating the ATF from over the horizon, with a freedom of movement well out of the reach of enemy observation and fires, creates leverage against the enemy's operational center of gravity. Exploiting these

opportunities to gain a tactical and operational advantage is true amphibious maneuver.

MOVING FORWARD

The Navy Expeditionary Force (NEF) possesses the world's most advanced and largest amphibious fleet in the world. With the flexibility of operating autonomously, free to navigate the oceans and waterways of the world, these powerful ships, aircraft and amphibious vessels can extend the arm of American assistance and crisis intervention to many locations worldwide. The amphibious component of the larger expeditionary force consists of: the Landing Helicopter Assault (LHA); the Landing Helicopter Dock (LHD); the Landing Personnel Dock (LPD); and the Landing Ship Dock (LSD). These ships can carry a wide variety of amphibious landing craft, which currently are: the Amphibious Assault Vehicle (AAV); the Landing Craft Utility (LCU); and the Landing Craft Air Cushion (LCAC). The USMC air component which supports an Amphibious Readiness Group (ARG) consists of: AV-8B Harriers; CH-53E Sea Stallion Helicopters; CH-46 Helicopters; AH-1 Cobra Helicopters; and UH-1 Helicopters. Hand in hand with these assets are the methodologies, rules, and techniques, which have been developed, tested and printed into warfare publications. Doctrine has risen out of this process.

Before 1986, conflicts were traditionally delineated "blue" (Navy) or "green" (USMC). The stovepipe mentality of single services did not take advantage of the synergistic effect of working together. The pie had to be cut too many different ways. The conflict arena, since the late 1980's, has become "purple" (joint), encompassing a greater depth of responsibility, resource management, unity of effort, and unity of

command. The joint force commander will impose his will upon the enemy, force the enemy to be off-balance and completely in the reactive mode. The JFC will then be able to use forces from the ATF to execute missions of an operational level significance vice those only at the tactical level. Two examples follow.

First, the struggle for the liberation of South Korea in 1950 was at a standstill until General Douglas MacArthur envisioned the capture of enemy critical lines of support that passed through the Han River Valley near Seoul. The amphibious landing force was able to land behind enemy lines at Inchon and march on enemy forces that were trying to protect vulnerable logistic lines from the north. A momentum was created from the sea, onto the beach at Inchon, then inland to an objective of operational proportions.

Second, operation "Husky," the invasion of Sicily during World War II, was a plan at the operational level that could have had a major impact on the course of the war. Though a success, German troops, tanks and artillery were able to avoid capture by escaping from the coastal port of Messina to Italy. Using the concepts embedded in OMFTS, the allied forces would have focused on Messina and the critical vulnerabilities of the two-mile channel to cut off German forces.

SHIP TO OBJECTIVE MANEUVER

OMFTS embodies the implementation of Ship-To-Objective Maneuver (STOM). STOM tactics employ the concepts of maneuver warfare and sea-basing to project combined arms force, by air and surface means, against inland operational objectives.³

There are six principles of STOM. First, "focus on the operational objective."⁴ The operational pause created by the old requirement to "stop, seize, defend and buildup the beachheads and landing zones"⁵

before pressing on to the objective would be omitted. Forces could be brought to bear directly on the enemy's critical vulnerabilities.

Second, "treat the sea as maneuver space."⁶ Operating close to shore or over the horizon, the sea provides unparalleled mobility. While denying the enemy any intelligence as to where the assault may come from, the enemy will be forced to defend long coastlines and innumerable inland positions. Joint force commanders will take full advantage of mobility and maneuver creating surprise and an operational advantage.

Third, "emphasize intelligence, deception and flexibility."⁷ Advanced intelligence and information networks will be at the fingertips of joint force commanders. Command and control systems with real time, tactical pictures will allow pre-assault, deception operations and amphibious maneuver to exploit enemy gaps and vulnerabilities.

Up-to-date intelligence information from optical and infrared satellite imagery, human sources, electronic support measures and a host of others, could be fed directly into the information network. The JFC could better observe "real-time" enemy force locations and strengths. Mobile missile caravans could be observed moving to defend specific airfields and supply lines to the north but not the south. Deception operations could then be focused to entice the enemy to remain in the north. The flexibility of the JFC to then maneuver his forces, based on intelligence and subsequent gaps in defense, would enable forces to exploit enemy vulnerabilities.

Fourth, "apply strength against weakness."⁸ Gaps and vulnerabilities in enemy defenses would be opened to attack by the projection of combat power. The capability of night fighting units using advanced night

vision devices or attacks through gaps discovered in defenses would enhance strengths against an adversary's weaknesses.

Fifth, "create overwhelming tempo and momentum."⁹ Maneuver from the sea by air and surface units directly to inland positions will allow the landing forces to dictate the pace. Operational surprise, through a combination of secrecy, deception, ambiguity, electronic warfare, lethal attacks and tactical successes, delays enemy recognition and disrupts his response.¹⁰ The tempo of operations will keep the enemy off balance, reactive and unable to affect the momentum of the operation.

Sixth, "integrate all elements in accomplishing the mission."¹¹ The naval forces will have available all assets from the combined or joint force organization. The potency of the landing force will be maximized when all of these assets can be brought to bear during STOM.

CAPABILITIES AND ISSUES

The principles of command and control, fires, mobility, and logistics have been the mainstay of successful naval operations since the beginning of time. These principles have endured even as new concepts and technologies helped to modify our doctrine. The proposed Navy concept, "Forward...Amphibious Maneuver From The Sea," will be the joint and service concept, written by the Navy, which will acknowledge advanced concepts and technologies. More importantly, it will formally bring to the table key issues, capabilities and challenges for Navy and USMC planners.

COMMAND AND CONTROL

Communication has quite naturally been the key for the command and control system during naval amphibious warfare. Traditionally, these

communication systems would provide headquarters, the Commander of the Amphibious Task Force (CATF) or Commander of the Landing Force (CLF), for instance, with the overall building blocks he required to recreate the battlefield. Piecemeal communications would flow in to CATF onboard the ship or to CLF on the beach; the situation critiqued and analyzed until CATF or CLF and their staffs transmitted communications back to the operators. The information network of the future will change the way we need to think about command and control. New technologies exist to keep commanders and troops in the field better informed than ever before. With the battle plan and objectives already in hand, battlefield commanders will be able to execute the plan as quickly as information flows to them.

This will effect doctrine in two different areas. First, OMFTS contends that CLF may no longer need to disembark the command ship to command the landing forces ashore. Information and advanced communications will allow him to control, interject or watch the battle problem unfold from onboard the command ship. Additionally, his traditional command staff may need to be split to support some of the requirements that still exist ashore.

Second, the control of exploiting maneuver at sea to create advantages inland, may be better placed in the hands of CLF. CATF currently remains in complete control of the amphibious fleet including: safety; navigation; course; speed; and formation. The flexibility that CLF will require to maneuver these forces may require that CLF be in charge at some point before LCAC's, LCU's, AAV's, or AAAV's depart the ships.

A number of further technical challenges embedded in USMC concepts must be addressed. The entire combat information center onboard the

LHA or LHD will need to be reconfigured to support the information network requirements of the future. Second, current configurations on amphibious ships which will take us into the future, namely the LHD, LHA, and LSD, are not configured to support the staffs of both CATF and CLF at the same.

Airborne command and control platforms can assist in maintaining the information link with forces ashore. As our amphibious ships remain further off the coast, command and information links will be stretched to their limits. Satellite coverage, atmospheric, and line-of-sight radios may restrict continuous contact with these forces.

The MV-22 has been proposed as a potential command platform of the future. This airborne asset could provide the information relay capability to bridge the gap between current equipment and that required for the future. Limitations, however, are its unpressurized cabin restricting it to 10,000 feet. This height could make the MV-22 susceptible to anti-air missiles. Additionally, the communications equipment to be installed may not be suitable to perform the complex mission. The SH-60B Light Airborne Multi-Purpose System (LAMPS) MK-III helicopter could provide the command and control requirements today, if required. These limitations raise both conceptual and technological issues. Is there enough money to configure the MV-22's with the required equipment? Who will control the LAMPS helicopter if it is used to fulfill the command and control requirement? When?

Non-organic aviation fires from the Air Force and the carrier battle group (CVBG) can provide a substantial amount of accurate weapons on target. The requests, coordination efforts and time-distance problems must be solved well in advance of expected fires. The issue of CLF remaining embarked onboard the amphibious command ship could be taken a

giant step further. CLF may need to be sitting next to the JFC onboard the carrier. Time-distance communications could be cut to zero with the resulting air cover and aviation fires being exponentially effective. Once again, where will CLF reside to best control the mission?

Amphibious Operating Areas (AOA) were traditionally established when the amphibious vessels, LCAC's, LCU's and AAV's, were heading ashore. Among other things, the AOA protected the landing forces from any friendly fires. The length, width, depth and duration for being in place was a source of contention for planners, CATF, CLF, and in particular, any non-organic fire supporters. The coordination aspects of who commanded what space, when, and for how long, were a challenge. As STOM evolves, the doctrinal requirements for these AOA's may disappear and will need to be addressed. The timeliness and accuracy of calls over the command and control net were vital to saving lives and equipment in the AOA's.

The importance of command and control practices today reach into every aspect of the battlefield. As we explore the new challenges of the future and address the concepts of OMFTS and STOM, command and control will continue to play a vital role.

FIRES

Naval Surface Fire Support (NSFS) includes the use of naval gunfire, surface-to-surface guided missiles and ballistic rockets. In order to support rapidly maneuvering forces in the littorals, NSFS responsiveness and coordination procedures must take on an increased role. Immediate high-volume suppression and neutralization fires must be available to support landing forces. The old concept of a

sustained, heavy volume of ammunition in a large area still plays its part for the commander; however, precision is taking over. Our troops on the ground may no longer be the primary means of armament in the field. Troops may maneuver first, then call in NSFS as the primary means of fire.

Battleships were the Navy's last capable platforms for raining accurate and continuous terror from the heavens. With no lethal, long range and highly accurate fires to support surface and vertical assaults, the Navy is pursuing guided munitions with extended range.

Designed in the early 1960's to be the primary Anti-Air Weapon (AAW), the MK-45 gun's role has changed with the advent of missiles. Accuracy, however, at the maximum range of approximately 13 miles was 400 meters. This accuracy further restricts the situations where gunfire can be used effectively without collateral damage to unintended targets.¹² When operating from over-the-horizon, targets in the littorals may be as much as 100 to 200 miles away. Future gun technology initiatives such as the CRAMSHELL with GPS and inertial navigation system (INS) can be "fired from 5-inch/54-caliber guns supporting a range of up to 80 miles, or vertically launched out to 230 miles."¹³

Safely nestled in the command bunker, 65 miles from the beach, the command staff frantically orchestrates the defenses to repel the anticipated American assault. Just over the horizon, as the Amphibious Readiness Group attends to a myriad of final details before launching the assault, consecutive puffs of smoke erupt from the destroyer's barrels as they prowl the troubled waters. Three minutes later, a rain of steel projectile thunders through the heavens, slamming into the reinforced concrete bunker at Mach 3.5. Not far away, a mobile SCUD launcher erupts into a ball of flames-yet another victim to a very bad day.¹⁴

Another technology which uses the MK-45 gun is the EX 71 Extended Range Guided Munition (ERGM). Designed for accuracy at 63 nautical

miles, the ERGM with its GPS receiver and INS provide an all-weather, day/night capability. Additionally, a Marine Corps study concluded that most NSFS targets "were most efficiently engaged with dual-purpose submunitions(anti-personnel and anti-artillery) which sufficiently suppress or neutralize enemy artillery in a position to defend the beachhead."¹⁵

Coupled with this new technology is the requirement to increase the recoil/counter recoil of the MK-45, as well as increasing the length of its barrel. These requirements are way ahead of the current technology on our advanced ships rolling off the line. The Arleigh Burke(DDG-51)-class Aegis guided missile destroyer is without the modified MK-45 gun. The new Essex class LHD, is without the MK-45 gun completely and the Tarawa class LHA has its 2 MK-45 guns scheduled for removal. Based on existing doctrine, NSFS would not begin until the cruise missile threat was eliminated. A requirement for NSFS today, though, noting the 13 mile range of the MK-45, would demand extremely close-in support of the Aegis community.

As we move towards OMFTS and STOM, but before the long range NSFS capability comes on line, Aegis ships could be drawn closer to the shoreline to perform NSFS for landed forces. Until "all" of the anti-cruise missile threats are disposed of, these ships could appear to be vulnerable. Traditionally, Aegis ships are the point anti-air warfare (AAW) defense ships for the carrier battle group. The Aegis operate on a tether of little more than three to ten miles. The proposal that an Aegis leave the carrier "unprotected" to perform NSFS from a position close to shore is a tough bargaining chip. As more Aegis enter service, we will need to address the capabilities provided by this multi-mission platform. As we tailor the "fleets" of the future, Aegis

may need to become one of the force multipliers in the ATF.

Organic aviation fires provided by the AH-1 Cobra and AV-8B Harrier have traditionally protected the ATF. In STOM the time-distance equation has broadened as the aircraft have to travel much greater distances just to arrive on target. Both airframes have a limited fuel capacity and are affected by adverse weather. These constraints can be alleviated by providing a logistics site ashore to replace aircrews, fuel and ordnance. Having this logistics footprint ashore violates the concept and principles of STOM and would not be considered as an option.¹⁶ Therefore, how will organic aviation fires support STOM?

MOBILITY

The movement of units by air and surface means from positions over the horizon directly to objectives possibly located miles inland will take full advantage of amphibious maneuver. The momentum created by advanced fires, tactical surprise and unity of effort against enemy critical vulnerabilities will keep the enemy completely off balance. Such support by these mobile forces will also require their protection whether over the horizon or close to shore. The requirement for movement at sea enabling the tactical advantage is also a requirement ashore.

During the Falklands conflict of 1982, the British were unable to counter the threat of air attacks and cruise missile attacks to their vulnerable fleet. HMS Sheffield and the container ship Atlantic Conveyor fell victim to Exocet, anti-ship, cruise missiles. Aircraft delivering "unguided iron bombs sank an additional twelve ships during British amphibious assault."¹⁷ The tailored threats in this case were Argentinean pilots flying 400 plus miles with limited fuel for prolonged engagements, delivering weapons from an altitude of

30-40 feet and 350 knots. The result was the loss of hundreds of lives and several ships to air attacks and cruise missiles.

Had British ships been able to launch their amphibious invasion force from the east, well over the horizon, the Argentinean pilots would not have been able to reach them. Amphibious maneuver from over the horizon would have provided the British the same stealth and safety that it can provide our forces as we implement the concepts OMFTS, STOM, and "Forward...From The Sea."

Whether operating from over the horizon or under the blanket of air superiority, there is still the threat of air launched or surface launched cruise missiles in the littorals. Whether off the coast of West Africa, the Korean Peninsula, or in the Arabian Gulf, more than ten potential threat countries employ anti-ship cruise missiles.¹⁸ The modified Aegis cruisers and destroyers with AN/SPY-1D(V) radars are designed to answer the challenges of these near-shore operations. The SPY radar was "specifically developed to counter smaller antiship cruise missiles flying lower and faster in the littoral clutter."¹⁹ These systems, however, will not become fully operational until their arrival on the Arleigh Burke (DDG-91) hull well after the turn of the century.

Theater missile attacks against the MAGTF at sea or inland is also of concern. With enemy capabilities to deliver conventional, chemical or biological warheads, Marines will require the protection from these threats as well. Concerns will arise over the location of the vessels providing missile-defense support.²⁰ Theater missile engagement geometry could require these ships to sail in predictable patrol areas making them vulnerable to subsurface threats. Additionally, the locations for this theater missile defense mission

may not coincide with that of an anti-ship cruise missile defense. The Aegis system is tremendously versatile. The constraints placed on her by the JFC will have to be closely tempered by the needs of AAW protection for the carrier, anti-cruise missile defense for the ATF, and counterbattery support for the forces on the shore and NSFS.

Once forces are safely inland, they could be vulnerable to enemy artillery fire. Countering enemy fire support is on many occasions the most important aspect of NSFS "because it protects friendly units and gives forces the freedom to maneuver."²¹ The AN/TPQ-37 Firefinder is one of the most effective tools for rapidly and accurately acquiring indirect fire support targets. Before the existing USMC shore-based counterbattery units could be employed, Aegis cruisers and destroyers could provide a seaborne platform to counter such attacks. The AN/SPY1-B/D(V) radar has the capability to provide counterbattery detection and location by finding enemy projectiles while airborne, determining their trajectory and working backwards to the launch position.

Arguments are that this would interfere with the primary Aegis mission of carrier AAW defense and the ship would be extremely vulnerable to cruise missile attacks while being so close to shore. A mission specifically listed by these multi-mission platforms is to provide NSFS to landing forces. When these ships are performing one of their multi-missions, they would have the capability to support counterbattery detection as well.

Seventeen warships of the United States have been damaged or sunk since the end of the Korean War. Fourteen of these have been from mines. Mine warfare during Desert Storm significantly impacted the naval expeditionary forces deployed in the Arabian Gulf. USS Princeton

(CG-59) and USS Triploi (LPH-10) were both victims to major damage from Iraqi mines. Since 1991, the world inventory of mines has increased by 50 percent.²² Amphibious Task Forces will take advantage of STOM concepts by remaining over the horizon, well out of the reach of enemy fires. The AAV and LCAC, however, will have to cross the waters of the littorals enroute to their objectives. Mine detection, sweeping and clearing operations along these beachheads could take weeks. Estimates of up to 40 days were planned for in order to clear the mine belt facing the amphibious readiness group during Desert Storm.²³

Although it may be difficult for an adversary to completely mine all of the approaches in the littorals, a single well-placed mine could have a profound affect on an amphibious operation. Current alternatives are that of a deliberate mine counter-measure (MCM) effort, possibly choosing the least likely entry points to invade the beachhead. Advances in ship's sonars could also play a role in the future. Navy and USMC planners will need to address future alternatives to the formidable challenges of mine warfare.

LOGISTICS

The logistics footprint for STOM should be no larger than the shadow of the Marine or the helicopter as it momentarily hovers over the landing zone. It should be constantly moving, supporting the forces as they maneuver against enemy vulnerabilities. As technology and innovation increase the combat effectiveness in every piece of our weaponry, lighter forces will be more and more lethal. The momentum created by these forces with smaller logistic tails will be exponential.

Sea-based logistics presents a challenge. It is difficult to imagine a sustained mission by amphibious forces without some form of logistics tail. With the initial delivery of forces dropped in to the objective area by vertical assets(helicopters, MV-22's), or surface assets(LCAC's, AAV's, AAV's, LCU's), smartly equipped light forces with advanced lethal weaponry should be able to negotiate their own logistics. This is a key component of OMFTS that has yet to be fully examined. If larger and larger forces arrive in the same manner, there will inevitably be some point where missions for air cover and support in the front will conflict with logistic requirements in the rear. ATF assets could be spread too thin.

CRITIQUE OF FORWARD...AMPHIBIOUS MANEUVER FROM THE SEA

The white paper, "Forward...From The Sea," states "we will be a full partner in developing new amphibious warfare concepts and capabilities for implementing the Marine Corps concept Operational Maneuver From The Sea (OMFTS)." ²⁴ The question then arises, "How do we get there from here?" It may even be enough to say that the Navy does not need to write or explore a new white paper such as that of FAMS. It is possible, though not probable, that new Navy doctrine will simply evolve over time as these new technologies arrive in the fleet.

SUMMARY

Dangers and opportunities exist in the littoral regions of the world. The Navy and USMC team have always been there to combat these dangers, take advantage of the opportunities, and continue to protect vital American interests. Our forward-deployed forces are the most formidable in the world today. A forcible entry capability will continue to be "the mission" of the USMC as they operate from naval

amphibious ships.

As we move into the twenty-first century, the new concepts of OMFTS and STOM will continue to keep our forces on the cutting edge of technology. Emphasizing the use of the sea as a medium for operational movement, sea-based fires and logistics will create opportunity for applying leverage against critical vulnerabilities essential to the enemy's ability to effectively continue to resist.

Bold new concepts are not always the easiest to comprehend, especially when viewed from just one side. The real question for the Navy remains, "How do we get there from here?" This paper has presented challenges and issues with doctrine and technologies in four key areas: command and control; fires; mobility; and logistics, which will have a profound effect on the way we do business in the future.

Command and control issues stretch from the location of CLF, to which forces (ground, air, sea) that CLF may or may not command, to the question of when he will command them. The location of his command facility will also need to be addressed.

Fires, from existing Mk-45 guns that have yet to be scheduled for any modifications, may not keep pace with the ERGM. Even new ships being built do not have the modifications. Until long range NSFS is available, where will Aegis be located? Will Aegis be assigned counterbattery as well? Can the Aegis provide counterbattery from over-the-horizon after ERGM is on line?

Mobility and continued safety of the forces afloat from cruise missile attacks will continue to be a concern. How many Aegis will it take to protect the carrier battlegroup and the ATF? How many will provide theater missile defense?

Logistics support for our highly mobile, highly lethal landing

forces is unanswered. The question remains, "How do we get there from here?"

CONCLUSION

In the joint world, it has become increasingly difficult to work out complex issues and challenges of rising new concepts and innovations on the battlefield. In its infancy, doctrine many times begins as an idea for the future, a way to do things better. It develops from a concept that needs to be tested against current technologies while postulated against ones of the future. Concepts have to survive challenges from both within a service and from without. Healthy discussions of feasibility, acceptability, and risk need to be dealt with. Evaluations in controlled environments, whether laboratories, test benches, or beachheads need to be conducted. This is the process.

Before new procedures are printed in warfare manuals, and before new weaponry reaches the fleet, concepts must be written. They must be formalized from a service who is willing to put it on the line for all to see. Services must allow the toughest questions to be asked of it. Although all questions may never be answered, they need to be put on the table and addressed. Key elements of the development process can then be put into place: budgetary considerations; research and development cells; training and education pipelines.

The unanswered questions beg doctrine and procedures for implementing these new concepts. First and foremost though, is the requirement for a specific Navy white paper, which will be the catalyst for combined planning between the Navy and United States Marine Corps.

Operational Maneuver From The Sea and Ship-To-Objective Maneuver provides the "ends" of where the Navy needs to be in support of these concepts. "Forward...Amphibious Maneuver From The Sea," when written,

will be *the* combined concept, written *by* the Navy, which will provide the catalyst for discussion that will answer the "ways and means."

ENDNOTES

¹Admiral Jay L. Johnson USN, "Forward...From The Sea: The Navy Operational Concept," March 1997, 9.

²General Charles C. Krulak USMC, "Operational Maneuver From The Sea," 1.

³Lieutenant General Paul K. Van Riper USMC, "Ship To Objective Maneuver," 7.

⁴Ibid., 3-7.

⁵Ibid.

⁶Ibid.

⁷Ibid.

⁸Ibid.

⁹Ibid.

¹⁰Ibid.

¹¹Ibid.

¹²J.Dennis Hagan, "Naval Gunfire Support," *Surface Warfare*, September/October 1997, 31.

¹³Lieutenant Steven C. Sparling USN, "Hypersonic Naval Surface Fires," *Surface Warfare*, September/October 1997, 27.

¹⁴Ibid., 26.

¹⁵Hagan, 33.

¹⁶Major Jeffrey P. Davis, "Ship-to-Objective Maneuver: Will This Dog Hunt?," U.S. Naval Institute *Proceedings*, August 1998, 32.

¹⁷Ibid.

¹⁸Ibid.

¹⁹Commander Robert J. Engel, USNR, "Bringing Aegis to the Littorals," U.S. Naval Institute *Proceedings*, January 1998, 42.

²⁰Davis, 33.

²¹Major James W. Hammond USMC, "Counterbattery from the Sea," U.S. Naval Institute *Proceedings*, April 1998, 30.

²²Scott Truver and Richard Nagle, "Foundering on Rocks, Shoals, and Mines," U.S. Naval Institute *Proceedings*, August 1997, 51.

²³Davis, 33.

²⁴Admiral Jay L. Johnson USN, "Forward...From The Sea: The Navy Operational Concept," March 1997, 9.

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